HTS to CASS TPS Rehost Process

Mukund U. Modi
Naval Air Warfare Center
Aircraft Division
Lakehurst, NJ 08733
Phone (908)323-7002/ Fax (908) 323-7445
E-mail: modimp@lakehurst.navy.mil

Joanne K. Buckley
Naval Air Warfare Center
Aircraft Division
Lakehurst, NJ 08733
Phone (908)323-5235/ Fax (908) 323-7445
E-mail: bucklejp@lakehurst.navy.mil

I. Introduction

As Automatic Test Equipment (ATE) approaches obsolescence it becomes necessary to off-load existing Test Program Sets (TPS) from an old ATE to the newest. Historically, this TPS off-load or re-host to the new ATE involved re-writing the test program and re-designing the associated hardware resulting in high non-recurring design cost and the recurring cost to produce quantities of the TPS for field use. Considerable cost savings could be achieved if the existing TPS data and hardware could be used on the host ATE. The Navy developed a pilot program to investigate the feasibility of salvaging existing TPS data and hardware by re-engineering the TPS to operate with Consolidated Automated Support System (CASS), the newest Navy Tester.

II. Objective

The objective of this pilot program was to develop a more cost effective and rapid process for rehosting existing TPSs from the Navy "family" of ATE to CASS. The effort involved the following tasks:

1. Conceptualizing a process that would make maximum possible use of the existing test program design and Interface Devices (ID).

2. Developing the tools required to convert test programs and IDs to be CASS compatible.

3. Rehosting a sample of four SRA TPSs from the Hybrid Test Station (HTS) to CASS to prove the feasibility of more efficient re-hosting and determine relative costs.

4. Estimating costs to re-host TPSs.

III. Technical Approach

The TPS Rehost effort maximizes reuse of both ATLAS code and ID hardware. Although this process involved the re-hosting of HTS TPSs to CASS, the process can be considered generic in nature as it can be followed for re-hosting from any specific ATE to any other ATE. The following is the seven-step approach.

1. Perform a comparison analysis of the HTS Building Blocks and the CASS Assets. This was accomplished by developing a methodology for "Resource Mapping" the HTS to CASS.

2. Perform a comparison analysis of HTS Abbreviated Test Language for Automated Systems (ATLAS) to CASS ATLAS.

3. Perform a comparison analysis of the HTS interface to the CASS Interface. This was accomplished by developing an Electrical/Mechanical conversion methodology.

4. Develop an HTS ATLAS to CASS ATLAS translator using the output from steps 1 through 3 above.

5. Modify an existing HTS ID to mate with CASS.

6. Translate a representative sample of four HTS TPSs from HTS ATLAS to CASS ATLAS.

7. Integrate and demonstrate re-hosted TPSs on CASS.

Figure 1 shows the HTS to CASS TPS Rehost Process that would maximize both code and ID reuse.

IV. TPS Rehosting Process

V. Summary of Results

The underlying principle with which the effort was undertaken was to retain the integrity of the field-proven TPS performance. Thus, the rehosted TPSs are of equal or better quality as the original design. By maintaining the test philosophy and basic design of both the test program and the interface device three important objectives were met:

1. Traceability of the re-hosted TPS to the original design was maintained thereby maintaining the effectiveness of the currently fielded TPS on the HTS.

2. Substantial reductions in cost and time over the conventional approach of redesigning the TPS in the conventional process.

3. The original Ids are adapted to the CASS requirements thus avoiding not only most of the redesign effort but also saving the large expense of producing complete new ID kits for each of the CASS sites.

The four selected TPSs proved to be very representative of simple and moderately complex TPSs supported by the HTS. All of the tests were converted automatically using the process developed. There were a few tests that were flagged by the translator and required TPS engineering analysis for proper translation. Having an operable HTS available to closely examine test results proved to be invaluable. In most cases, the only addition to the existing ID was wiring to re-route signals to their proper locations. In one instance simple load resistors had to be added since they are not available on CASS. The ID adapters can be even more compact in future designs by utilizing flex cabling rather than the standard wiring used in the pilot effort.

VI. Savings Potential

Experience with other offload efforts using the typical approach of redesigning the TPS shows that it typically costs as much as the original TPS development cost. Utilizing the tools and processes developed in this pilot effort, the re-hosting cost is estimated to be 30 to 50 percent of the original development cost, thus saving an estimated 50 to 70 percent new design, development and site outfitting cost.

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